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RUDY STEGEMOELLER

Attorney at Law
P.O. Box 359
Poestenkill, NY 12140
(518) 283-0933
rudysteg@capital.net

Docketing Department
Public Service Commission of South Carolina
101 Executive Center Dr.
Suite 100
Columbia, SC 29210

May 19, 2006

Docket No. 2005-387-E: IN RE: Petition of the Office of Regulatory Staff to Establish Dockets to Consider Implementing the Requirements of Section 1254 (Interconnection) of the Energy Policy Act of 2005

Dear Sir/Madam:

Enclosed please find an original and one copy of the Comments of Plug Power Inc. in the above-captioned proceeding. Copies have been served on all parties on the Service List as of this date.

Sincerely,

Rudy Stegemoeller, Esq.
for Plug Power Inc.
P.O. Box 359
Poestenkill, NY 12140
(518) 283-0933
rudysteg@capital.net

BEFORE
THE PUBLIC SERVICE COMMISSION OF
SOUTH CAROLINA
DOCKET NO. 2005-387-E

IN RE: Petition of the Office of Regulatory Staff to Establish Dockets to Consider Implementing the Requirements of Section 1254 (Interconnection) of the Energy Policy Act of 2005

COMMENTS OF PLUG POWER INC.

Introduction

Plug Power appreciates the opportunity to submit these comments to the Commission. Streamlined interconnection procedures are a necessary condition for the development and deployment of distributed generation technologies for residential and small commercial customers.

Plug Power is a leading provider of clean, reliable on-site energy—focused on a future fueled by distributed energy, and grounded in putting fuel cell technology to work today. Plug Power has gained extensive experience in the design and operation of proton exchange membrane (PEM) fuel cell systems since its inception in 1997. The Company's focus on natural gas-powered fuel cell systems has resulted in the successful deployment of over 650 fuel cell systems with increasing functionality and reliability and decreasing cost. GenCore® commercial fuel cell products provide backup power for telecommunications, utility and uninterruptible power supply applications. Fueled by hydrogen, these systems provide extended backup power reliably and efficiently over a wide range of outdoor conditions with zero emissions.

Streamlined interconnection procedures are essential for the development of small distributed generation.

Until the late 1990's, interconnection procedures for distributed generation were designed for cogeneration facilities in the megawatt size range. Interconnection rules that are sensible for large projects, however, create unnecessary and insuperable barriers for small projects.

As a general rule, a smaller DG project is more vulnerable to being rendered uneconomic by unnecessary transaction costs. In the case of a five kW fuel cell, for example, interconnection costs of $1000 would add $200 per kW to the installed cost of the unit. In other words, interconnection costs for a small unit, on a dollars per kilowatt basis, can approach the entire installed capital cost of a large gas turbine. This presents an enormous barrier to entry for small DG technologies.

Plug Power considers a certified anti-islanding inverter to be a necessary component of any unit that will operate in parallel with utility systems. The cost of anti-islanding equipment is a manufacturing cost and not an "interconnection cost." For a small DG project, "interconnection costs" are those additional costs imposed by utilities, primarily for engineering studies, testing, and metering, which are in many cases unnecessary.

Development of interconnection rules involves creating a reasonable balance between the DG developers' need for predictable, uniform and inexpensive procedures, and the utilities' need for the flexibility to ensure that any particular installation will not have an adverse effect on distribution systems. In striking this balance, a procedure that is reasonable for a 500 kW project will in almost all cases be prohibitive for a 20 kW project.

IEEE 1547 and the FERC Interconnection Procedures are a starting point for the development of state rules.

In 2000-01 several states, notably Ohio, Texas and New York, adopted guidelines for interconnection of units in the 0-25 kW range. These guidelines avoided most of the studies and costs that were necessary for larger projects.

In 2001 FERC initiated a collaborative process to develop interconnection rules for generators of all sizes. Although FERC's jurisdiction over distribution lines was questioned, the process resulted in a partial consensus on a streamlined process for inverter-based units up to 10kW. At the same time, IEEE was developing the 1547 standard, the refinement of which is a continuing process.

It is important to note the distinction between the technical standards of IEEE 1547 and the procedural rules that have been developed by FERC and many states. IEEE 1547 is relevant to the design and testing of distributed generation units, but does not dictate the process for evaluating applications and studying individual projects.

One of the essential elements of the FERC rules is the pre-certification process for small inverter-based generators. The pre-certification process puts the burden on the manufacturer to have equipment manufactured and tested to meet the applicable technical standards. This eliminates the need for costly study and testing of each individual project.

The FERC rules represent a negotiated partial consensus. From the standpoint of small DG developers, the FERC rules are an acceptable model for states, but not an ideal model. The "primary screens" applicable to small projects in the FERC process represent layers of review that are unnecessary for the vast majority of projects.

Recognizing this, several states have gone beyond the provisions of the FERC rules to further eliminate unnecessary and costly review requirements. A common sense approach to small projects can be found in Massachusetts' rules (cited below) in which an

inverter-based project of 10 kVA or smaller can avoid all but one element of the FERC screening process. The Massachusetts rule was also developed through a collaborative process and has the agreement of the local utilities.

New York's Standardized Interconnection Requirements (cited below) avoid the use of a screening process altogether, relying instead on a provision that prevents utilities from charging study fees for projects of 15 kVA or smaller. In Plug Power's experience, New York's approach has been very effective in securing fast, common-sense analysis of interconnection applications. When the time comes that aggregate levels of DG on the system create the potential for realistic concerns, then a more formal screening process will need to be considered.

Streamlined interconnection projects below 20 kW should not be subject to fees.

As described above, interconnection fees have the potential to cripple a DG project. The future of small DG depends on standardized interconnection rules that protect customers from having to pay for unnecessary studies.

Following is a non-exhaustive list of states in which no application or study fees are required for small inverter-based projects that meet the requirements for simplified interconnection:

Indiana (170 Indiana Administrative Code 4-4.3)

Massachusetts (DTE Order dated February 24, 2004, Docket No. 02-38-B)

Minnesota (Order dated September 28, 2004, Docket No. E-999/CI-01-1023)

New Jersey (New Jersey Administrative Code 14: 4-9)

New York (Standardized Interconnection Requirements, PSC Order dated November 17, 2004, Case 02-E-1282)

North Carolina (NCUC Order dated March 22, 2005, Docket No. E-100,Sub 101)

Texas (PUC Substantive Rules Section 25.211)

Wisconsin (Public Service Code 119.02)

Virginia (20 Virginia Administrative Code 315)

The fee exemptions adopted in these jurisdictions do not represent a subsidy. They reflect two facts: first, that the small amount of work required of a utility for these projects is simply a form of customer service; and second, that these projects can be presumed to require no study in almost all cases. If utilities are to have the discretion to analyze each project, this discretion is best controlled by limiting cost recovery. The

New York Commission explained its rationale for exempting projects of 15 kVA or smaller from fees:

> "The intent of this revision is to discourage the utilities from performing superfluous and unnecessary system studies, while at the same time encouraging them to operate in as efficient a manner as possible when processing applications of this nature."

New York State Public Service Commission, Case 02-E-1282, Order Modifying Standard Interconnection Requirements, November 6, 2002, page 5.

In some cases, interconnection costs have been imposed because utility personnel have been unfamiliar with the equipment and have, understandably, been reluctant to approve its use on their system without a thorough review. However, at the present time small DG units have been operating across the country for million of hours without creating substantial problems, and national technical standards are in place. Plug Power encourages utility personnel to spend time making themselves familiar with anti-islanding inverter systems; but DG developers should not be required to pay for this type of analysis when their equipment has already been certified under national standards.

No additional insurance should be required.

The states cited above either have no insurance requirement for streamlined interconnection or have a simple requirement that is consistent with reasonable levels of liability insurance that would customarily be held by small customers.

In most cases, requiring a customer to procure additional insurance in order to install a distributed generation unit will put an end to a potential project. Because interconnection standards are designed to eliminate almost all of the risk associated with running a distributed generation system in parallel with a utility system, there is no need for additional insurance.

Small inverter-based units shonld be able to interconnect to networks without requiring reverse flow relays.

Plug Power acknowledges that the characteristics of networked distribution systems can make interconnection analysis more complex for many projects. It is important that a DG unit not cause network protective equipment to cycle. However, in the case of an inverter-based project 20 kVA or smaller, in an area with little or no aggregate DG installed, there is no danger of such disruption. Only a complete disappearance of the load on the network would cause such a small unit to interfere with network protectors. A complete disappearance of load would only realistically occur during a fault situation; and in that case, the anti-islanding equipment would cause the unit to cease energizing within a fraction of a cycle.

Plug Power proposes that for projects of 15kVA or smaller, there should be a strong presumption that reverse relays are not required, and they should be required only upon a

detailed showing of need. This would include a showing that the size of the project, in relation to a realistic estimate of minimum load on the network, creates a realistic potential for the project to cause protective equipment to cycle. Such a rule would allow for the development of small DG in the load pockets where demand reduction is most needed, while enabling utilities to identify problems in the rare circumstances where they may occur.

This approach was adopted by the New York State Public Service Commission, which oversees the nation's largest networked distribution system, in New York City. The Commission found that:

> "[I]t seems unlikely that backfeed from a 5 kW fuel cell ... could impact the operation of network protection devices ... A blanket requirement for [reverse power relays] is not in keeping with the goal of crafting a standard to apply to all types of generation in any given circumstance. However, if it can be demonstrated by the utility that this function is essential to ensure the integrity of the system, given site-specific conditions, they should be accorded the discretion to do so."

New York State Public Service Commission, Case 02-E-1282, Order Modifying Standardized Interconnection Requirements, November 17, 2004, page 12.

Conclusion

In order to expedite the development of small distributed generation, the Commission should adopt streamlined rules for interconnection of small inverter-based units. These rules should prevent the imposition of unnecessary reviews, fees, or insurance requirements.

Respectfully submitted,

Rudy Stegemoeller, Esq.
for Plug Power Inc.
P.O. Box 359
Poestenkill, NY 12140
(518) 283-0933
rudysteg@capital.net

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